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Potassium solubilizing *Serratia* species for growth promotion in tomato

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As the third essential plant macronutrient, potassium plays crucial roles in plant growth, metabolism and development. The most common soil components of potassium, 90–98%, are feldspar and mica which are plant unavailable forms. Therefore, potassium fertilizers are generally used for the soil supplementation. However, the demand and the cost of fertilizers has been increasing over the years. Soil microorganisms are also involved in sustaining soil as well as crop productivity. Some of them are capable of decomposing aluminosilicate minerals and releasing a portion of the potassium contained therein. This study isolated four potassium solubilizing microorganisms as CRa (bacterial), FU2 (fungal), FU10 (fungal), and FU20 (fungal) from four selected sites around Kandy and Kurunegala. According to the potassium dissolving ability and availability in soil, CRa bacterial isolate was selected as the best isolate over the other three. Plant growth promoting and disease controlling ability of CRa isolate was tested using seeds of T-245 tomato variety. CRa inoculated garden soil effectively improved the seed germination rate and seedling shoot length when compared to the natural soil. CRa inoculated soil effectively suppressed the seedling root pathogens by reducing the number of diseased seedlings compared to the natural soil treatment. CRa bacterial isolate and FU10 fungal isolate was identified as in Genus *Serratia* and in Genus *Aspergillus* respectively according to the morphological and bio chemical characteristics. Since CRa isolate is effective in solubilizing potassium and also as a plant growth-promoting rhizo-bacterium, it can be potentially developed as a plant growth promoting inoculants.

Key words: *Soil microorganisms, potassium solubility, mica powder, growth promotion, disease control*

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